

## P-T-fluid evolution of retrogressed pelitic granulite from the Limpopo Complex, South Africa

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Hydration of granulites and formation amphibolite-facies mineral assemblages is a common process in retrogressed high-grade metamorphic terranes worldwide. Here we report new petrological data of hydrated pelitic granulite from the Southern Marginal Zone (SMZ) of the Neoproterozoic Limpopo Complex in South Africa, and discuss P-T-fluid evolution based on pseudosection analysis. The pelitic granulite has a mineral assemblage of garnet + biotite + orthopyroxene + cordierite + quartz + K-feldspar + plagioclase, which is regarded as a product of decompression after the peak M1 metamorphism. The application of mineral equilibrium modelling in NCKFMASH system yields a P-T range of 750-830C/6-8.5 kbar and molar H<sub>2</sub>O content in the rock (M(H<sub>2</sub>O)) of 0.5-3 mol.% for the assemblage. The orthopyroxene is now totally surrounded by retrograde anthophyllite corona formed by significant increase of H<sub>2</sub>O activity at 750-790C/6-8.5 kbar and M(H<sub>2</sub>O) >4 mol.%. Kyanite + anthophyllite + quartz assemblage replacing cordierite was formed at consistent M(H<sub>2</sub>O) (>7 mol.%) but slightly lower temperature of 650-700C/6.5-7.5 kbar. Such a significant increase in H<sub>2</sub>O activity is possibly related to fluid infiltration along the Hout River Shear Zone, which marks the terrane boundary between the high-grade Limpopo SMZ and low-grade Kaapvaal Craton.

Keywords: granulite facies, hydration reaction, pseudosection, metamorphic fluid